

What is claimed is:

1. A stator current controller within an electric motor, the motor having a stator, a rotor with a rotor magnet, and an arbor to at least in part secure the rotor to the stator, the rotor  
5 having an inner surface defining a bounded region, the detector comprising:
  - a circuit board coupled to the arbor and, at least in part, within the bounded region;  
and
  - a magnetic field detector mounted on the circuit board for detecting a magnetic field produced by the rotor magnet, the magnetic field detector being within the bounded region.
- 10 2. The stator current controller as defined by claim 1 wherein the circuit board is a part of a flexible circuit.
- 15 3. The stator current controller as defined by claim 1 wherein the arbor has a top end and a bottom end, the magnetic field detection circuitry being closer to the bottom end than to the top end.
- 20 4. The stator current controller as defined by claim 1 wherein the circuit board is not perpendicular to an axis of the arbor.
5. The stator current controller as defined by claim 1 wherein the magnetic field detector is contained in a chip that is surface mounted to the printed circuit board.
- 25 6. The stator current controller as defined by claim 5 wherein the magnetic field detector includes a Hall effect device.
7. The stator current controller as defined by claim 1 further including printed circuit board electrical connections wherein the printed circuit board electrical connections consist of connections to a voltage supply, to ground, and to a plurality of stator windings.

8. A stator current controller within an electric motor, the motor having a stator, a rotor with a rotor magnet, and an arbor to at least in part secure the rotor to the stator, the rotor forming a bounded region, the detector comprising:

- means for detecting a magnetic field produced by the rotor magnet;  
5 means for mounting the detecting means; and  
means for coupling the mounting means to the arbor and, at least in part, within the bounded region.

9. The stator current controller as defined by claim 8 wherein the detecting means is  
10 positioned at least in part within the bounded region.

10. The stator current controller as defined by claim 8 wherein means for mounting includes a circuit board, the detecting means being surface mounted on the circuit board.

15 11. A stator current controller as defined by claim 8 further including means for generating a voltage proportional to the magnetic field.

12. A stator current controller as defined by claim 8 wherein means for coupling includes means for snapping the circuit board to the arbor.

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13. A motor comprising:  
a stator;  
a rotor with a rotor magnet, the rotor forming a bounded region;  
an arbor to at least in part secure the rotor to the stator;  
25 a circuit board coupled to the arbor and, at least in part, within the bounded region;  
and  
a magnetic field detector mounted on the circuit board for detecting a magnetic field produced by the rotor magnet.

30 14. The motor as defined in claim 13 wherein the magnetic field detector at least in part lies within the bounded region.

15. The motor as defined by claim 13 wherein the arbor has a top end and a bottom end, the magnetic field detector being closer to the bottom end than to the top end.

5 16. The motor as defined by claim 13 wherein the circuit board is not perpendicular to an axis of the arbor.

17. The motor as defined by claim 13 wherein the magnetic field detector is contained in a chip surface mounted to the printed circuit board.

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18. The motor as defined by claim 17 wherein the magnetic field detector includes a surface mounted Hall effect device.

19. The motor as defined by claim 13 wherein the motor is a brushless DC motor.

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20. The motor as defined by claim 13 further including printed circuit board electrical connections wherein the printed circuit board electrical connections include connections to a voltage supply, to ground, and to stator windings.

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